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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/532,095

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EXAMINER

KOSLOW, CAROL M

ART UNIT

PAPER NUMBER

1793

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/532,095

Applicant(s)

KIM ET AL.

Examiner

C. Melissa Koslow

Art Unit

1793

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 April 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____.

The drawings are objected to because there are two figure 2s, one of page 1/3 and the other on page 2/3. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

The disclosure is objected to because of the following informalities: On page 4, line 32, "th e" should be "the". Appropriate correction is required.

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required:

The specification teaches drying the mixture at 100-150°C for 1-24 hours. This does not provide antecedent basis for the subject matter of claims 4 and 5 which teaches the drying step is either performed at 100-150°C for any time or performed for 1-24 hours at any temperature.

Claims 2-7, 9, 12 and 13 are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. Subject matter that is critical or essential to the practice of the invention, but not included in the claims means the claims are not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976).

Page 4, lines 14-22 teaches that if the heat treating temperature is outside the range of 800-1500°C then the luminous efficiency is reduced and the rest of the specification indicates that an europium activated strontium silicate phosphor having a high luminous efficiency is an essential aspect of the invention.

Claim 17 rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention.

Claim 17 teaches the LED is a blue LED, but pages 5-7 teach the LED is a long wavelength UV LED. This discrepancy needs to be clarified.

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting

ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1, 14, 15, 17 and 18 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 3, 5, 8, 10, 11, 14 and 17 of copending Application No. 10/564,406. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims in copending Application No. 10/564,406 teach a white light emitting device comprising a LED, such as a blue LED, and a phosphor, preferably molded by a transparent resin, where the phosphor emits light in the range of 500-550 nm and has the formula $\text{Sr}_{2-x}\text{Eu}_x\text{SiO}_4$, where x is 0.001-1. Thus the claims of the copending application teach the claimed phosphor and white LED chip of this application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by U.S. patent 2,297,108.

This reference teaches a strontium silicate phosphor activated by about 0.1 wt% europium. Table 1 teaches a should having the host formula of Sr_2SiO_4 . When the weight percentage is converted to molar percent, the amount of europium is about 0.2 mol%. It was well

known at the time of invention that the formula for taught phosphor can be written as $\text{Sr}_2\text{SiO}_4:\text{xEu}$, where x is about 0.002 or $\text{Sr}_{2-\text{x}}\text{Eu}_\text{x}\text{SiO}_4$, where x is about 0.002. This formula fall within that claimed and thus the reference teaches the claimed phosphor.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. patent 3,505,240.

This reference teaches phosphors having the formula $(\text{Ba}_{2-\text{x}}\text{Sr}_\text{x})\text{SiO}_4:0.0005-0.05 \text{ Eu}$, where x is 0-2 and exemplifies one where x is 2. It was well known at the time of invention that the formula for taught phosphor can be rewritten $\text{Sr}_{2-\text{x}}\text{Eu}_\text{x}\text{SiO}_4$, where x is 0.0005-0.05. the amount of europium overlaps that claimed. Product claims with numerical ranges which overlap prior art ranges were held to have been obvious under 35 USC 103. *In re Wertheim* 191 USPQ 90 (CCPA 1976); *In re Malagari* 182 USPQ 549 (CCPA 1974); *In re Fields* 134 USPQ 242 (CCPA 1962); *In re Nehrenberg* 126 USPQ 383 (CCPA 1960). The reference suggests the claimed phosphor.

Claims 1, 14, 15 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. patent 6,621,211.

This reference teaches a white light LED chip comprising an LED and an europium alkaline earth silicate phosphor having the general formula $\text{M}_2\text{SiO}_4:\text{Eu}^{2+}$, where M is at least one of Ba, Ca and Sr. Column 7, lines 20-34 teaches that this phosphors has the formula $\text{Sr}_{2-\text{x}}$

$\text{SiO}_4:\text{xEu}^{2+}$, where $0 < \text{x} \leq 0.2$ and that this phosphor emits light of about 580 nm. This light emission falls within the claimed range and the amount of europium overlaps that claimed. Product claims with numerical ranges which overlap prior art ranges were held to have been obvious under 35 USC 103. *In re Wertheim* 191 USPQ 90 (CCPA 1976); *In re Malagari* 182 USPQ 549 (CCPA 1974); *In re Fields* 134 USPQ 242 (CCPA 1962); *In re Nehrenberg* 126 USPQ 383 (CCPA 1960). The figures and section 7 "the Illumination System" show that the LED and phosphor are molded by a transparent resin. The reference suggests the claimed phosphor and device.

Claims 1-15, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. patent 6,982,045.

This reference teaches a white light chip comprising a blue LED and an europium alkaline earth silicate phosphor having the general formula $\text{M}_2\text{SiO}_4:\text{Eu}^{2+}$, where M is at least one of Ba, Ca and Sr and the amount of europium is 0.000001-0.05. Column 5, lines 12-14 teaches M can be Sr and figure 5 teaches this phosphor has an emission peak in the range of about 500-580 nm. This light emission falls within the claimed range and the amount of europium overlaps that claimed. Product claims with numerical ranges which overlap prior art ranges were held to have been obvious under 35 USC 103. *In re Wertheim* 191 USPQ 90 (CCPA 1976); *In re Malagari* 182 USPQ 549 (CCPA 1974); *In re Fields* 134 USPQ 242 (CCPA 1962); *In re Nehrenberg* 126 USPQ 383 (CCPA 1960). Figures 2A-2C and column 6, lines 50-66 show that the phosphor and LED are molded by a transparent resin.

Column 7, line 45 through column 8, line 52 teaches the phosphor is produced by weighting out strontium carbonate, silica and europium oxide, mixing the compounds in water,

drying the mixture and heat treating the dried mixture at about 1050°-1250°C in a reducing atmosphere. The taught temperature range falls within the claimed heat treating temperature range. The references does not teach the drying conditions, but one of ordinary skill in the art would know to use drying condition so as to remove the water and form a dry powder, which means heating it at a temperature above the boiling point of water and below the reaction and decomposition temperature of strontium carbonate, silica and europium oxide, which is less than 1000°C and for a time that would remove the water and form a dry powder, absent any showing to the contrary. This suggested and thus obvious temperature range of about 100°C to less than 1000°C overlaps the claimed drying temperature range. The drying time that would remove the water and form a dry powder would be expected to at least overlap the claimed range since the claimed drying time is that sufficient to remove the water and form a dry powder and the suggested drying temperature encompasses the claimed range, absent any showing to the contrary. One of ordinary skill in the art would have found it obvious to use any known method of drying, such as drying in an oven, absent any showing to the contrary. While the heat treating temperature is not disclosed, one of ordinary skill in the art knows that it is that sufficient to form the phosphor when the mixture is heated at about 1050°-1250°C in a reducing atmosphere. One of ordinary skill in the art would expect this time to at least overlap the claimed range since the time ranges of claims 9-11 are that sufficient to form the phosphor, absent any showing to the contrary. Finally, the reference does not exemplify the claimed reducing atmosphere, but it indicates that any known reducing atmosphere can be utilized. Thus one of ordinary skill in the art would have found it obvious to use the known reducing atmosphere of a mixture of 2-25% hydrogen mixed with nitrogen. The reference suggests the claimed phosphor, process and device.

Claims 14-16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. patent 6,956,247; 7,026,775 or 7,088,038.

U.S. patent 6,956,247; 7,026,775 or 7,088,038 all teach a white light LED chip comprising a phosphor, where the LED is placed in a reflection cup and the phosphor and LED are molded by a transparent resin. These references teach the phosphor can be an europium alkaline earth silicate phosphor having the general formula $M_2SiO_4:Eu^{2+}$, where M is at least one of Ba, Ca and Sr. While the references do not teach the amount of europium, it is well known in the art, as shown by the above references, that the amount of europium that effect to activate the alkaline earth silicate host and that this amount ranges from greater than 0 up to 0.2, which overlaps the claimed range. Thus the references suggest that the device contains a phosphor having the formula $M_2SiO_4:Eu^{2+}$, where the amount of europium is greater than 0 up to 0.2. Product claims with numerical ranges which overlap prior art ranges were held to have been obvious under 35 USC 103. *In re Wertheim* 191 USPQ 90 (CCPA 1976); *In re Malagari* 182 USPQ 549 (CCPA 1974); *In re Fields* 134 USPQ 242 (CCPA 1962); *In re Nehrenberg* 126 USPQ 383 (CCPA 1960). The references suggest the claimed device.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melissa Koslow whose telephone number is (571) 272-1371. The examiner can normally be reached on Monday-Friday from 8:00 AM to 3:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo, can be reached at (571) 272-1233.

The fax number for all official communications is (571) 273-8300.


Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

cmk
January 18, 2008


C. Melissa Koslow
Primary Examiner
Art Unit 1793